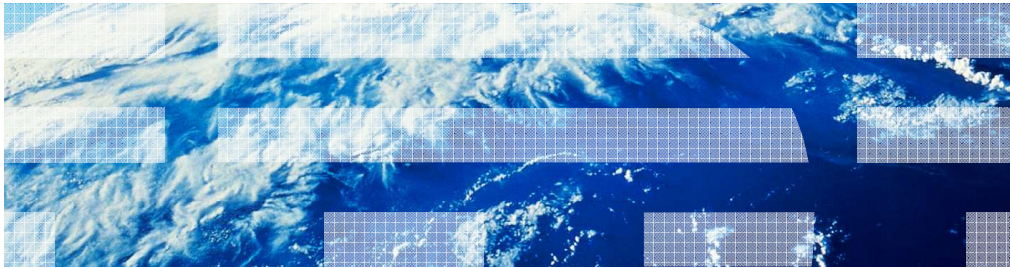

IBM WebSphere Adapters V7.0

WebSphere adapter for FTP



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This presentation will focus on the WebSphere Adapter for FTP V7.0.

Agenda

- Overview
- Enterprise metadata discovery
- Business object structure
- What is new in V7.0?
- Problem determination
- Summary

This section will provide an overview of the WebSphere Adapter for FTP.

Overview: WebSphere Adapter for FTP

- IBM WebSphere Adapter for FTP
 - Implements the Java 2 Enterprise Edition (J2EE) Connector Architecture (JCA), version 1.5 specification
 - Enables bi-directional connectivity
 - Events and responses captured as files on the file system
 - Supports transformation of data to xml
 - When data transformation is involved the business objects are pre-generated, otherwise a fixed structure is used.
 - Supports transfer of files using SSL
 - supports Federal Information Processing Standards (FIPS)
 - Supports COBOL copy books for both inbound and outbound
 - Support for Secure FTP (FTP over SSH)

The IBM WebSphere Adapter for FTP implements the JCA 1.5 specification. It enabled bi-directional connectivity, both inbound and outbound, with those Enterprise Information System business applications that can communicate only through files. Events and responses are captured as files on the file system. The WebSphere Adapter for FTP uses the same business object structure for both inbound and outbound processing. The file is seen as a byte array in the business object for pass-through scenario. In a case where data transformation is required, you have to generate the wrapper over the objects that you want to use. You can use the “external service” wizard or the “business object from external data wizard” to create the wrapper objects. The adapter supports transformation of COBOL records to business objects incase of inbound and data sent in business object to COBOL records for outbound scenarios. The adapter had support for secure transfer of data using SSL and FTP over SSH

Configuration steps

- **Discovery:** Discovering EIS metadata and automatic creation of components to access the EIS
- **Development:** Create application which make use of the discovered components
- **Enablement:** Configuring the runtime with the location of the EIS provider jars/native libraries
- **Administration:** Deploy all required components to runtime, and administer them

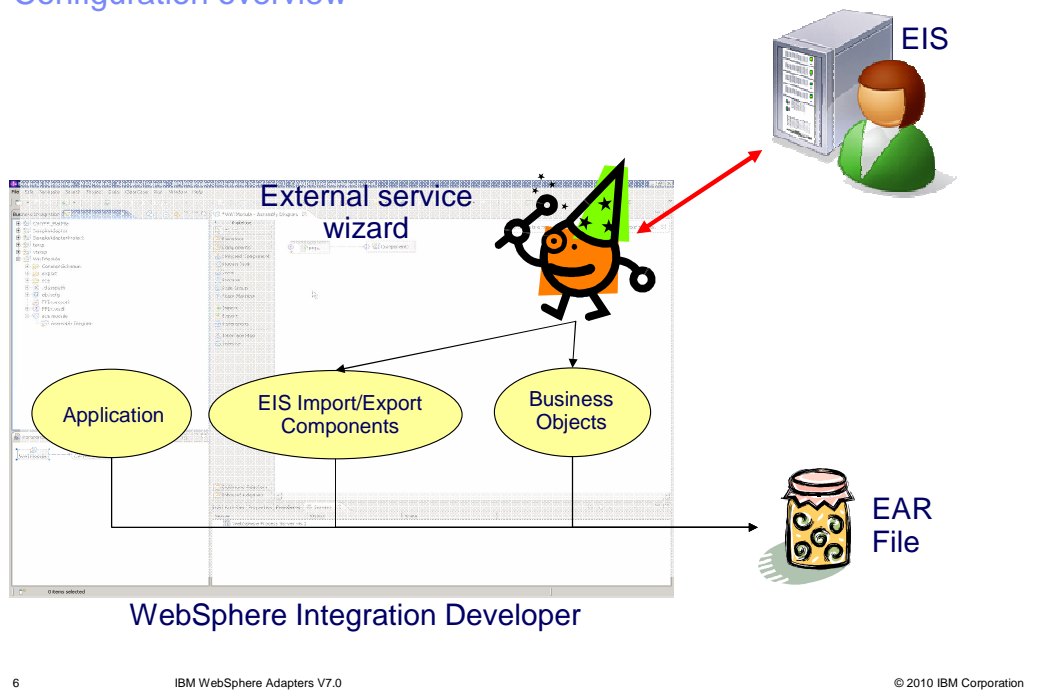


This slide summarizes the steps involved in using adapter as part of your application and how to administer them. At a high level the interaction steps can be broken down into four steps. The first step is the discovery phase where you use the external service wizard to configure the adapter and generate the necessary artifacts. The next step is the development phase where you use the generated artifacts to create your application. The third step is the enablement step where you specify the necessary dependency files required at runtime by the adapter. For example the SAP adapter uses the sapjco.jar file to communicate with the SAP system. The last step is to create the Enterprise Broker Archive (EAR) file, deploy it to the runtime and administer the application. For the FTP adapter, there is no enablement step as it requires no dependencies.

Enterprise metadata discovery

This section will provide an overview of discovery process for WebSphere Adapter for FTP.

Configuration overview



This slide depicts the steps involved in configuring the adapters and creating a deployable application. WebSphere Integration Developer provides an external service wizard that connects to the EIS, introspects and imports the metadata information and creates the necessary artifacts. The artifacts generated by the wizard are the import or export components and the business object definitions. The interaction style you choose when configuring using the wizard defines the generation of either an import or an export component. The supported interaction styles are inbound and outbound. Once the artifacts are created for you, you can use these generated artifacts as part of your application flow. The finished application project is exported as an ear file that you deploy to the runtime.

Enterprise service discovery

- Enables the generation of business object definitions and other artifacts required by SCA
- FTP file business object
 - Pre-defined structure for non Data Transformation Framework (DTF) flows
 - Adapter is unaware of the content of the file for non Data Transformation Framework (DTF) flows.
 - Adapter can parse files based on a configured delimiter.
 - Adapter can use pre generated business object structures.
- Service discovery for FTP is used
 - To specify activation specification and managed connection factory properties as input to build the service description
 - To specify any custom adapter properties

Enterprise Service Discovery in WebSphere Integration Developer implements the Enterprise MetaData Discovery Specification. The Enterprise Service Discovery wizard steps you through configuration of the adapter properties, service descriptions, and business object discovery, and results in the generation of the artifacts required for integration with SCA applications. With the WebSphere Adapter for FTP, there is no need for “discovery” of business objects; there is a pre-defined structure for the business objects for both inbound and outbound processing. The adapter views the file as the data, and does not look inside the contents of the file for pass through. Therefore; service discovery for the FTP Adapter is used mainly to specify values for the properties used in activation specification, managed connection factory, and adapter properties.

Discovery steps - Outbound

- Provide connection properties
- Chose to deploy connector along with module or separate
- Specify operations
 - Select Operation type
 - Select data type(pass-through or user defined)
 - Pass-through with business graph
 - Pass-through without business graph
 - User defined
 - Configure operation
 - Specify operation name
 - Specify data binding class (example: FTPFileBaseDataBinding)
 - Specify data handler (Needed for specific cases when using user defined data type.
example: XML data handler)
 - Specify interaction specification properties

This slide summarizes the important steps involved in the discovery process using the external service wizard for outbound interaction style. For ftp adapter, you provide the user name, password and ftp server details. You are prompted for the output directory where the adapter places the processed data. You will also be prompted to specify if you want to deploy the connector module along with the ear file or if you want to deploy it separately by itself. More information about deploying the connector RAR file by itself is covered in the overview presentation.

The next step involves the configuration of operations supported by the adapter one at a time. It is not mandatory to create a business graph. You can just choose to create a business object with out the graph. The “Data type for the operation” field provides you the option of creating the business object definitions with business graph without business graph and to define your own data type. The first two options deal with pass-through data where the adapter does not do any transformation of the data. The user defined option is used when you want the adapter to convert the data in the business object to a different format(for example, to xml or to COBOL records).

The next panel in the wizard prompts you for the operation name, the data binding and the data handler. You need to specify the data handler only if you need the adapter to transform the data coming in the business object.

You can specify properties at interaction specification level for each operation. For example, for your create operation, if you always want to create files in one specific folder, you can specify the output directory at the interaction specification level. This will take precedence over any value you provided at the initial connection properties screen. Also you do not have to provide any value for the output directory at the business object level in your application.

Discovery steps - Inbound (1 of 2)

- Provide connection properties
 - Activation spec properties
 - Chose to deploy connector along with module or separate
- Specify rules to filter events
- Specify Function selector – map events to export function name
 - FilenameFunctionSelector
 - Rule based function selector.
 - EmbeddedFunctionSelector
 - used in case of content-specific business objects, where the object name is embedded in the event file

This slide summarizes the important steps involved in the discovery process using the external service wizard for inbound interaction style. For the FTP adapter, there are no user name or password fields. You are prompted for the directory the adapter should poll for any files. You will also be prompted to specify if you want to deploy the connector module along with the ear file or if you want to deploy it separately by itself. More information about deploying the connector RAR file by itself is covered in the overview presentation.

The adapter provides you the ability to define rules to filter incoming events. Only those files that satisfy your criteria specified in the rules are picked from event directory.

Another important configuration for inbound is the function selector. In Inbound, Function Selectors are required in order to map between events generated by resource adapters and the appropriate SCA export function name. There are two function selectors that are supported by the ftp adapter. These are FilenameFunctionSelector and EmbeddedNameFunctionSelector. The FilenameFunctionSelector is a rule-based function selector that can match a regular expression on a file name to an object name. This function selector is used for pass-through data or when the adapter cannot determine the business object name from the contents of the incoming file. The EmbeddedNameFunctionSelector is used in case of content-specific business objects, where the object name is embedded in the event file.

Discovery steps - Inbound (2 of 2)

- Specify Operations
 - Operation type is always emit
 - Select Data type(pass-through or user defined)
 - Business Graph optional
 - Configure operation
 - Specify operation name
 - Specify Data binding class (example: FTPFileBaseDataBinding)
 - Specify Data handler (Needed for specific cases when using user defined data type.
example: XML data handler)

The next step involves the configuration of operations. You can have more than one operation defined for inbound interaction style. You can choose to create a business object with out the graph. The “Data type for the operation” field provides you the option of creating the business object definitions with business graph without business graph and to define your own data type. The first two options deal with pass-through data where the adapter does not do any transformation of the data. The user defined option is used when you want the adapter to convert the user defined data in the polled file to be mapped to the user defined business object.

The next panel in the wizard prompts you for the operation name, the data binding and the data handler. FTPFileBaseDataBinding is the only supported data binding. You need to specify the data handler only if you need the adapter to transform the data coming into a user defined structure in the ftp file business object.

Business object structure

The next section will provide an overview of the business objects created by the external service wizard for pass-through and user-defined scenarios.

Business object structure

The screenshot displays the Business Integrator interface with three callouts:

- List of all business objects created for pass-through scenario:** A tree view on the left shows a project named 'CWYFT_FTPFile' containing various data types and interfaces. The 'Data Types' folder is expanded to show objects like 'FTPFile', 'FileContent', and 'UnstructuredContent'.
- FTPFile business object with the protocol specific attributes:** A detailed view of the 'FTPFile' object showing attributes such as 'DirectoryPath', 'Filename', 'ChunkInfo', 'FtpServerHostName', 'FtpServerEventDirectory', 'DataConnectionMode', 'FileTransferType', 'SecondServerDirectory', 'SecondServerUsername', 'SecondServerPassword', 'FileContentEncoding', 'IncludeEndBODelimiter', 'FileInLocalDirectory', and 'LocalDirectoryPath'.
- Wrapper object created for user-defined type:** A detailed view of the 'CustomerWrapper' object showing attributes like 'DirectoryPath', 'Filename', 'ChunkInfo', 'FtpServerHostName', 'FtpServerEventDirectory', 'DataConnectionMode', 'FileTransferType', 'SecondServerDirectory', 'SecondServerUsername', 'SecondServerPassword', 'FileContentEncoding', 'IncludeEndBODelimiter', and 'FileInLocalDirectory'. It also shows a nested 'Customer' object with attributes 'CustomerName', 'Address', 'City', and 'State'.

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This slide shows the screen capture of the business objects created and the business object structure for both pass-through and user-defined scenarios. You can see the FTPFile business object with all the protocol specific information like directory Name, file name and so on. The Content attribute should be set to unstructured as the adapter just takes the value specified in the unstructured object and write it as-is in the output file. The screen capture on the bottom right side shows an example for the user-defined type. The customer object that you imported is wrapped by a wrapper object with protocol specific information. The content attribute is set to the user-defined object you imported during the discovery process.

Retrieve operation supports data transformation. So instead of just returning the content as text in the “UnstructuredContent” field of FTPFile business object, you can now configure the adapter to convert the data into an appropriate business object. In order to support this feature you need to create a retrieve response wrapper object. More details about this feature and the business object are covered in the presentation that covers outbound functionality.

What is new in V7.0?

This section will provide details on the enhancements and new features introduced in version 7.0

Enhancements and new features for version 7.0

- Enhancements
 - Support for global elements
 - Remote verification of host
 - Explicit mode for FTP over SSL/TLS

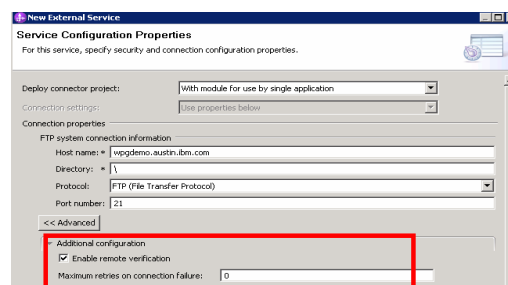
WebSphere adapter for FTP supports global elements in structured business objects. Global elements with null namespace are also supported. In previous versions the adapter will fail to generate a wrapper on these business objects. This enhancement enables you to discover object definitions containing global elements and create business objects based on these definitions.

Remote verification of host property is used to verify if the host system requesting the data transfer to or from the FTP server is the same host system on which the adapter is running.

Support is added for explicit mode of FTP over SSL/TLS. Implicit mode support is already enabled in previous version.

Remote verification of host

- Remote verification of host
 - New property in EMD panel
 - Default is enabled
 - If enabled, check if the data/control connection are from the same host before establishing connection



When a client connects to the FTP server, two kinds of connections or channels are established; a command connection (also known as control connection), and a data connection. The command connection is used to send FTP commands and receive replies to and from the server and the data connection is the channel through which the data transfer takes place between the client and the server.

Remote verification of host property is used to verify if the host system requesting the data transfer to or from the FTP server is the same host system on which the adapter is running. The verification is done while establishing a data connection to perform data transfer. This property is applicable only to FTP and FTPS protocols

FTPS – Explicit mode

- connection begins with an unencrypted FTP connection
- client explicitly issues a request to switch to a secure FTP connection when
 - sensitive information, such as password, needs to be sent
- works with the default port 21 and is compliant with RFC 2228 commands

The screenshot shows the configuration interface for the IBM WebSphere Adapter. The 'Secure configuration' section is expanded, and the 'FTPS connection mode' is set to 'Explicit'. The 'Data channel protection level' is set to 'Private - Data is transferred in encrypted form'. Other fields include 'Host key file', 'Private key file', 'Keystore type' (JKS), 'Truststore file', 'Truststore password', 'Keystore file', 'Keystore password', and 'Key password'.

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IBM WebSphere Adapter

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In an explicit mode, the connection begins with an unencrypted FTP connection. When any sensitive information, such as password, needs to be sent, the client explicitly issues a request to switch to a secure FTP connection. After the successful SSL negotiation, a secure command channel is established between the client and the server.

Explicit mode works with the default port 21 and is compliant with RFC 2228 commands. RFC 2228 specifies the mechanism for authenticating connections and confidential data transfer between the client and server, and this is referred to as explicit mode. The AUTH command is used for specifying the security mechanism for the explicit mode. The client sends an AUTH command to the FTPS server and switches to a secure command connection

Problem determination

This section covers problem determination for the FTP adapter.

Problem determination

- Covered in the Adapters Overview presentation – Recap:
 - WebSphere Process Server log files
 - SystemOut.log and SystemErr.log
 - Adapter Log and Trace files configured in WebSphere Integration Developer External service wizard
 - Also can set RAR custom properties in the Administrative console of the Process Server
 - Different logging level levels can be set
- Enabling trace for Adapters in WebSphere Process Server :
 - Set the tracing level string as "com.ibm.j2ca.ftp.*=finest"

Listed here are the log files for WebSphere Process Server. The adapter logs the entries in the SystemOut.log and SystemErr.log files. You can also enable tracing for more detailed information. Note the trace string used to turn on tracing of the ftp adapter.

Summary

This section is a summary of the topics covered in this presentation.

Summary

- WebSphere Adapter for FTP enables integration with SCA Applications and Enterprise Information System applications that can communicate only through files
 - Inbound and Outbound support
- Provides support for Enterprise Service Discovery for discovering services
- Supports data transformation for both inbound and inbound

In this presentation, you learned that the WebSphere Adapter for FTP enables integration with SCA business integration applications and Enterprise Information System applications that can communicate only through files in a remote system. The adapter supports both inbound and outbound interaction. Enterprise service discovery is used to create the service description and to provide the managed connection factory, activation specification properties and any specific custom adapter properties. More details on inbound and outbound functionality are covered in their individual presentations.

Reference information

- WebSphere Adapter for FTP User Guide
- Java Connector Architecture
 - <http://java.sun.com/j2ee/connector/index.jsp>
- Enterprise metadata discovery
 - <http://www.ibm.com/developerworks/java/library/j-emd/>
- WebSphere Adapter Information Center
 - <http://www.ibm.com/software/integration/wbiadapters/library/infocenter/>
- WebSphere Business Process Management Information Center
 - <http://publib.boulder.ibm.com/infocenter/dmndhelp/v7r0mx/index.jsp>

Additional reference information can be found at these addresses.



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